

PATENT



IN THE U.S. PATENT AND TRADEMARK OFFICE

Appellants: Sungho JIN et al.
Appl. Serial No.: 09/338,520
Group No.: 2879
Filed: June 23, 1999
Examiner: A. Patel
For: CATHODE WITH IMPROVED WORK FUNCTION AND
METHOD FOR MAKING THE SAME
Attorney Docket No.: 37310-000125/US

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APPEAL BRIEF

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

January 9, 2004

Dear Sir:

Appellants submit herewith their Brief on Appeal in triplicate as required by 37 C.F.R. 1.192.

(1) REAL PARTY IN INTEREST:

The real party in interest is Agere Systems, Inc., as evidenced by an assignment from Lucent Technologies Inc. dated January 30, 2001 (copy attached as Exhibit 1).

(2) RELATED APPEALS AND INTERFERENCES:

No related appeals or interferences are known.

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(3) STATUS OF THE CLAIMS:

Claims 1-3, 6, 9-15, 17-22 and 36 stand finally rejected under 35 U.S.C. §102(e) as being anticipated by Saito et al. (U.S. Patent No. 6,124,666).¹

Claims 1 and 20 stand finally rejected under 35 U.S.C. §102(b) as being anticipated by Buxbaum et al (U.S. Patent No. 4,272,030).

Claims 14 and 15 stand finally rejected under 35 U.S.C. §103(a) as being unpatentable over Saito et al. (U.S. Patent No. 6,124,666).

Claims 23-35 have been withdrawn in prosecution as being directed to a non-elected invention.

(4) STATUS OF ANY AMENDMENT FILED SUBSEQUENT TO FINAL REJECTION:

The Request for Reconsideration, filed May 12, 2003, has presumably been entered.

(5) SUMMARY OF THE INVENTION:

The present invention is related to a thermoionic cathode with an improved work function used in projection electron lithography, a technique used in the formation of integrated circuits and the like. The cathodes of the present invention comprise three layers; a substrate, buffer and emissive layer. The function of the buffer, "located between the substrate and emissive layer," is "inhibiting interaction of said emissive layer and said substrate by way of one of altering and altering and blocking the substrate." (See Appendix attached, claim 1.)

¹ Claim 13 was finally objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form to include all of the features of base claim 1 and intervening claims. For purposes of this appeal, claim 13, which depends on claims 12, 11, 10, 6 and 1 will be grouped with those claims.

FIG. 5 depicts an exemplary cathode 110 of the present invention. As shown, the cathode 110 comprises a substrate 112 (the bottom layer), a buffer 114 (middle layer) and an emissive layer 116 (the top layer).

The buffer 114 alters the grain structure at the surface of the substrate 112 by diffusion or alloying, or through precipitation or new phase formation. The buffer 114 includes atoms from a chemical class similar to the chemical class of the substrate 112. For example, if the substrate 112 is a refractory metal or carbon, then the buffer 114 would also include refractory metal or carbon atoms.

The buffer 114 also provides thermal and electrical conductivities and good adhesion to withstand operating temperatures up to 2100° K. One additional advantage of the cathode 110 illustrated in Figure 5, is that such a layered cathode can be made in a curved shape (concave or convex), which is useful for electron beam focusing.

The following sets forth some examples illustrating materials which may make up exemplary cathodes of the present invention.

Example 1

This example describes a first material combination that is effective in creating a desired structural uniformity and work function uniformity on a polycrystalline Ta cathode surface. Example 1 is a Ta/Mo/W/Ta arrangement, where Ta is used as the polycrystalline substrate surface, Mo/W is used as two sequentially applied buffer layers, and Ta is used as the emissive layer.

In this example, both Mo and W have the same body centered cubic (bcc) structure as Ta, and form solid solutions. Because of the relatively small size of Mo atoms, the first buffer of Mo atoms diffuse into the Ta substrate upon annealing at 1600°C. This Mo diffusion alters the crystalline structure of the existing Ta grains. The subsequent W layer further alters the grain structure on the surface by diffusion to form a solid solution of Ta-Mo-W. The final Ta layer serves as the emissive layer because it has the lowest work function of the three.

In Figure 6A, an Mo layer 1142 is added to the Ta substrate 112. Because of the relatively small size of the Mo atoms, the Mo atoms diffuse into the Ta substrate 112 upon annealing at 1600°C. This Mo diffusion alters or distorts the crystalline structure of the existing Ta grains to form Ta/Mo region 1144, thereby randomizing the orientation of the Ta substrate. Then, a W layer 1148 is added, as illustrated in Figure 6B. The W layer 1148 further randomizes the grain structure on the surface by diffusion to form a solid solution of Ta/Mo/W at 1150. Finally, the Ta emissive layer 116 is added, as illustrated in Figure 6C. The final Ta layer serves as the emissive layer, because it has the lowest work function of the three. The grain structure of the Ta layer 116 is also randomized because of the underlying Ta/Mo/W region 150.

The Mo layer 1142 and W layer 1148 are typically added at a thickness of 0.5-10 μm . In other examples, both the Mo layer 1142 and the W layer 1148 may be selected from the group including Mo, W, Nb, V, Ir, Rh, or any combination thereof.

Example 2

This second example describes a second material combination that is also effective in creating a desired structural and work function uniformity on a polycrystalline Ta cathode surface. Example 2 is a Ta/Re-Ta/Ta arrangement, where Ta is used as the polycrystalline substrate 112, Re-Ta is used as an alloyed buffer film 113, and Ta is used as the emissive layer 116, as illustrated in Figure 7.

Because Re has a hexagonal close-packed (hcp) structure, it forms various intermetallic compounds with Ta. The co-sputtered Re-Ta alloy film 113 thus consists of a fine-grained (<4 μm), randomly oriented surface structure, which blocks the original polycrystalline grain structure of the Ta substrate 112. The subsequent emissive Ta layer 116 also has the same fine grain structure because of the Re-Ta alloy film 113. Because of the formation of intermetallic compounds and the resultant multiphase structure, the grains in the substrate 112 are largely

pinned by the new phases of the buffer film 113 at the boundaries and their growth is inhibited at the operating temperature (2100°K). Also Re is closely matched to Ta in its thermal expansion coefficient, and as a result, the buildup of thermal stresses which cause film delamination and cracking, is reduced.

Although the intermetallic compound of Example 2 is a Re-Ta alloy, other combinations are also effective including C-Ta, Hf-Ta, Os-Ta, and Ru-Ta.

Example 3

A final example describes a third material combination that is effective in creating the desired structural uniformity and work function uniformity on a polycrystalline Ta cathode surface as well. Example 3 is a Ta/Re/Ta arrangement, where Ta is used as the polycrystalline substrate 112, Re is used as a buffer layer 1160, and Ta is used as the emissive layer 116, as illustrated in Figure 8.

In Figure 8A, a Re layer 1160 is added to the Ta substrate 112. The Re reacts with Ta to form Re-Ta intermetallic compounds. Similar to Example 2, these Re-Ta intermetallic compounds have a fine grained (<4 μm) randomly oriented surface structure, which block the original polycrystalline grain structure of the Ta substrate 112. Finally, the Ta emissive layer 116 is added, as illustrated in Figure 8B. The final Ta layer serves as the emissive layer, because it has the lowest work function of the three. The grain structure of the Ta layer 116 is fine and randomized because of the underlying Re-Ta alloy 1162.

The material arrangements in Examples 1-3 have shown improved uniform emission characteristics in emission microscopes and SCALPEL™ machines compared to conventional Ta cathodes.

(6) ISSUES PRESENTED:

Issue 1: Are claims 1-3, 6, 9-15, 17-22 and 36 anticipated by Saito et al. ("Saito")?

Issue 2: Are claims 1 and 20 anticipated by Buxbaum et al. (“Buxbaum”)?

Issue 3: Are claims 14 and 15 rendered obvious by Saito et al.?

(7) GROUPING OF CLAIMS

Appellants respectfully request that the following claims be grouped together as indicated. Group I: claims 1-3, 6, 9-13, 17-22 and 36; Group II: claims 14 and 15. Appellants respectfully assert that each of Groups I and II are separately patentable for the reasons set forth below.

(8) ARGUMENTS WITH RESPECT TO THE ISSUES PRESENTED FOR REVIEW:

A. Issue 1: Are claims 1-3, 6, 9-15, 17-22 and 36 anticipated by Saito et al.?

(i) Claims 1-3, 6, 9-15, 17-22 and 36 are not anticipated by Saito because Saito does not disclose a buffer for “inhibiting interaction of [an] emissive layer and [a] substrate by way of one of altering, and altering and blocking such substrate”.

Claim 1, the only independent claim involved in this appeal, reads as follows:

1. A thermoionic cathode, comprising:
a substrate;
an emissive layer; and
a buffer, located between said substrate and said emissive layer, said buffer inhibiting interaction of said emissive layer and

said substrate by way of one of altering, and altering and blocking said substrate.

As is apparent from the paragraph above, claim 1 of the present invention is directed at a thermoionic cathode which comprises a substrate, an emissive layer and a buffer located between the substrate and emissive layer. The claimed feature of the buffer is to inhibit interaction of the emissive layer and the substrate by altering, and altering and blocking the substrate.

In contrast, Saito does not disclose a buffer or any other layer which inhibits or otherwise prevents a substrate from interacting with the emissive layer by altering, and altering and blocking the substrate. Instead, components of Saito's substrate (referred to as a "base 1" in Saito), more specifically, silicone (Si) and magnesium (Mg) referred to as "reducing agents" (see column 1, line 15 and column 6, lines 53 and 54) are allowed to diffuse through the grain surfaces of Saito's buffer (referred to as an "alloy layer 4" in Saito) to react with barium oxide (BaO) at an interface between the alloy layer 4 and the emissive material layer 6. It is inescapable that the alloy layer 4 of Saito does not alter and block the reducing agents from the base 1 from interacting with the emissive layer 6, a requirement of claim 1 of the present invention.

The Examiner does not appear to dispute the absence in Saito of a buffer which inhibits interaction of an emissive layer and a substrate layer by altering and altering and blocking a substrate, as in claim 1 of the present invention. Instead, the Examiner appears to be ignoring this claimed feature by refusing to give patentable weight to this feature of the present invention because "it is narrative in form". The Examiner requests that claim 1, and in particular the "inhibiting interaction feature, be placed in means plus function language in order to carry a patentable weight." Other than citing Section 112, paragraph 6, the Examiner does not rely upon any case law for such a rejection.

Case law does not support the Examiner's decision. Instead, claim features, such as the term "inhibiting" in the present claims cannot be ignored and must be given patentable weight.

For example, in *In re Echerd*, 176 USPQ 321 (C.C.P.A. 1973), the CCPA held that "there is nothing inherently wrong in defining something by what it does rather than what it is" (decision rejecting applicant's claims based on obviousness because all of the specific structure claimed was old, the novelty residing solely in functional terms in the claims, reversed). See also *In re Swinehart and Sfiligoj*, 169 U.S.P.Q. 226 (C.C.P.A. 1971).

Appellants submit that the Examiner's failure to give patentable weight to the words "inhibiting interaction of said emissive layer and said substrate by way of one of altering and altering and blocking said substrate" in claim 1 is erroneous.

The Examiner's requirement that the inhibiting features of claim 1 must be put into means plus function language in order "to carry a patentable weight" is also erroneous. The Federal Circuit has held that as long as a claim "recites sufficient structure" *Rodime PLC v. Seagate Technology, Inc.*, 174 F.3d 1294,1302 (Fed.Cir.1999), *Personalized Media Communications, Inc. v. International Trade Commission*, 161 F.3d 696,703-705 (Fed.Cir.1998), and the term used to describe the structure has a reasonably well understood meaning in the art, *Greenberg v. Ethicon Endo-Surgery, Inc.*, 91 F.3d 1580,1583 (Fed.Cir.1996), *Personalized Media Communications, LLC v. International Trade Commission*, 161 F.3d at 704-705, it falls outside of 35 U.S.C. §112, sixth paragraph.

Here, the language of claim 1, namely "a buffer, located between said substrate and said emissive layer, said buffer inhibiting interaction of said emissive layer and said substrate by way of altering and altering and blocking said substrate" satisfies *Rodime*, *Personalized Media* and *Greenberg*. The inhibiting feature is associated with the sufficient buffer structure in claim 1 and the term "buffer" is one that is well known to those skilled in the art.

In sum, because the claim terms relating to the inhibiting feature of claim 1 fall outside the scope of 35 U.S.C. §112, sixth paragraph, it follows that these terms need not be placed into means-plus-function language in order for the Examiner to give them patentable weight. When they are given patentable weight, the deficiencies of Saito become apparent. Appellants respectfully submit that the Board must find that independent claim 1 and its dependent claims 2, 3, 6, 9-15, 17-22 and 36 are allowable over Saito.

B. Issue 2: Are claims 1 and 20 anticipated by Buxbaum?

(i) Claims 1 and 20 are not anticipated by Buxbaum because Buxbaum does not disclose a buffer for “inhibiting interaction of [an] emissive layer and [a] substrate by way of one of altering, and altering and blocking such substrate”.

As indicated above, claim 1 requires a buffer which inhibits the interaction of an emissive layer and substrate by altering, and altering and blocking the substrate. The second reference relied on to reject claim 1 is Buxbaum. The so-called substrate in Buxbaum is referred to as a “sintered body consisting of support metal (e.g., molybdenum) in an activator substance (c. 3, 11, 32-34)”. To anticipate claim 1 of the present invention, Buxbaum must disclose a buffer which alters and blocks this sintered body 1 from interacting with an emissive layer. Buxbaum, however, does not disclose such a buffer. Instead, Buxbaum indicates that “the barrier layer 3 must form no alloy with a diffusion promoting additive 2 which alters the activator substrate 1 chemico-physically and could decrease its diffusion to the cathode surface” (column 2, lines 37-40). In sum, Buxbaum’s barrier layer purposefully does not alter its sintered body or substrate.

Similar to the rejection based on Saito, the Examiner does not appear to dispute that Buxbaum does not disclose the buffer of claim 1. Instead, the

Examiner again decides to give no patentable weight to the inhibiting feature of claim 1 of the present invention.

For the reasons set forth previously above, Appellants believe the Examiner is in error. When the terms relating to the inhibiting feature of claim 1 are given patentable weight, the deficiencies of Buxbaum become apparent. Appellants respectfully request that the Board reverse the rejections based on Buxbaum and allow claims 1 and 20.

C. Issue 3: Are claims 14 and 15 rendered obvious by SAITO?

Claims 14 and 15 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Saito. Appellants submit that, at the least, these claims are allowable for the reasons set forth above regarding corresponding independent claim 1 and any intervening claims.

The only way that Saito can render obvious claims 14 and 15 is by using hindsight, which is not permitted, see for example *W. L. Gore and Associates, Inc. v. Garlock, Inc.*, 220 USPQ 202, 212-213 (Fed. Cir. 1983) cert. denied 469 U.S. 851 (1984). More specifically, because Saito does not describe or suggest a buffer as in the claims of the present invention, the only way Saito can render obvious claims 14 and 15 is to make use of the buffer disclosed and claimed in the present invention which inhibits the interaction of an emissive layer and substrate by altering, and altering and blocking a substrate. This is impermissible. *Id.*

In addition to overruling this rejection based on impermissible hindsight, the Board should overrule this rejection because Saito teaches away from the present invention. Saito teaches that components of its base are allowed to diffuse to an interface which borders an emissive layer. Such a diffusion is inapposite to the necessary claim feature of altering, and altering and blocking a substrate. Because Saito suggests features which are inapposite to claimed features of the

present invention, Saito cannot render obvious claims 14 and 15 of the present invention which depend upon claim 1.

(9) CONCLUSION

For all the reasons set forth above, the present invention as recited in Appellant's pending claims 1-3, 6, 9-15, 17-22, and 36 are not anticipated nor rendered obvious to one skilled in the art, as asserted by the Examiner. Accordingly, it is respectfully submitted that the claimed inventions are properly patentable over the cited art. It is therefore respectfully requested that this Appeal be granted and that the Examiner be reversed.

In the event that any matters remain at issue in the application, the Examiner is invited to contact John E. Curtin at (703) 668-8046 in the Northern Virginia area, for the purpose of a telephonic interview.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 08-0750 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Respectfully submitted,

HARNESS, DICKEY, & PIERCE, P.L.C.

By



John E. Curtin, Reg. No. 37,602

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Reston, Virginia 20195
(703) 668-8000

JEC:psy

Attached: (10) Appendix: Pending claims of record
Exhibit 1: Statement under 37 CFR 3.73(b)

(10) APPENDIX:

1. A thermoionic cathode, comprising:
a substrate;
an emissive layer; and
a buffer, located between said substrate and said emissive layer, said buffer inhibiting interaction of said emissive layer and said substrate by way of one of altering, and altering and blocking said substrate.
2. The thermoionic cathode of claim 1, wherein said buffer alters said substrate by randomizing a crystallographic orientation of a grain structure at a surface of said substrate contacting said buffer.
3. The thermoionic cathode of claim 2, wherein said buffer by altering miniaturizes grain sizes of grains at the surface of said substrate contacting said buffer.
6. The thermoionic cathode of claim 2, wherein said buffer alters the grain structure at the surface of said substrate contacting said buffer by at least one of dissolution, alloying, reaction, precipitation, and new phase formation.
9. The thermoionic cathode of claim 1, wherein said cathode has a curved shape.
10. The thermoionic cathode of claim 6, wherein said buffer is a solid solution buffer.

11. The thermoionic cathode of claim 10, wherein said buffer includes at least two of the group consisting of Mo, W, Nb, V, Ir, Rh, and Ta.

12. The thermoionic cathode of claim 11, wherein the solid solution buffer includes molybdenum, tungsten and tantalum.

13. The thermoionic cathode of claim 12, wherein said substrate and said emissive layer are made of tantalum.

14. The thermoionic cathode of claim 1, wherein said cathode is part of a projection electron lithography system.

15. The thermoionic cathode of claim 14, wherein the projection electron lithography system is a SCALPEL™ system.

17. The thermoionic cathode of claim 1, wherein said buffer is an alloyed buffer.

18. The thermoionic cathode of claim 17, wherein said buffer is an alloy comprising at least two elements with different crystalline structure.

19. The thermoionic cathode of claim 17, wherein said buffer is made of a grain growth inhibiting multiphase structure.

20. The thermoionic cathode of claim 1, wherein said buffer includes at least two of Re, Ta, C, Hf, Tc, Os, and Ru.

21. The thermoionic cathode of claim 20, wherein the buffer includes rhenium and tantalum.

22. The thermoionic cathode of claim 21, wherein said substrate and said emissive layer are made of tantalum.

36. The thermoionic cathode of claim 1, wherein said buffer alters and blocks said substrate by reacting therewith to form a randomly oriented surface structure.

STATEMENT UNDER 37 CFR 3.73(b)Applicant/Patent Owner: Agere Systems Inc.Application No./Patent No.: 09/338,520 Filed/Issued Date: June 23, 1999Entitled: CATHODE WITH IMPROVED WORK FUNCTION AND METHOD FOR MAKING THE SAMEAgere Systems Inc., corporation

(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

1. ☒ the assignee of the entire right, title, and interest; or
2. ☐ an assignee of less than the entire right, title and interest.
The extent (by, percentage) of its ownership interest is _____ %

In the patent application/patent identified above by virtue of either:

A. ☐ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel _____, Frame _____, or for which a copy thereof is attached.

OR

B. ☒ A Chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as shown below:

1. From Inventor(s) To: Lucent Technologies Inc.
The document was recorded in the United States Patent and Trademark Office at
Reel 010123, Frame 0468, or for which a copy thereof is attached.
2. From Lucent Technologies Inc. To: Agere Systems Guardian Corp.
for which a copy thereof is attached.
3. From Agere Systems Guardian Corp. To: Agere Systems Inc.
for which a copy thereof is attached.

☐ Additional documents in the chain of title are listed on a supplemental sheet.

☒ Copies of assignments or other documents in the chain of title are attached.

[Note: A separate copy (i.e., the original assignment document or a true copy of the original document) must be submitted to Assignment Division in accordance with 37 CFR Part 3, if the assignment is to be recorded in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

January 9, 2004

Date

John E. Curtin

Typed or printed name

Signature

Attorney of Record

Title

EXECUTION COPY

PATENT ASSIGNMENT

by and between

LUCENT TECHNOLOGIES INC.

and

AGERE SYSTEMS GUARDIAN CORP.

Dated as of January 30, 2001

PATENT ASSIGNMENT

THIS PATENT ASSIGNMENT (this "Assignment"), effective as of January 30, 2001 (the "Effective Date"), is by and between Lucent Technologies Inc., a Delaware corporation, with offices at 600 Mountain Avenue, Murray Hill, New Jersey 07974, United States of America, ("ASSIGNOR") and Agere Systems Guardian Corp., a Delaware corporation, with offices at 555 Union Boulevard, Allentown, PA 18109, United States of America ("Agere Systems Guardian").

RECITALS

A. WHEREAS, the Board of Directors of ASSIGNOR has determined that it is in the best interests of ASSIGNOR and its stockholders to separate ASSIGNOR's existing businesses into two independent businesses;

B. WHEREAS, ASSIGNOR presently owns or controls certain patents, patent applications, and invention submissions listed in the attached Appendices A and B (hereinafter "TRANSFERRED PATENTS") and;

C. WHEREAS, in furtherance of the foregoing separation, ASSIGNOR desires to transfer, assign, convey, deliver and vest all of its interests and rights in TRANSFERRED PATENTS for all countries, jurisdictions and political entities of the world, to and in Agere Systems Guardian;

NOW, THEREFORE, in consideration of the premises and for other good and valid consideration, the receipt and sufficiency of which are hereby acknowledged, the parties, intending to be legally bound, agree as follows:

ASSIGNOR, subject to existing rights and licenses of third parties, does hereby assign, convey, transfer and deliver, and agrees to assign, convey, transfer and deliver to Agere Systems Guardian, its successors, assigns and legal representatives or nominees, ASSIGNOR's entire right, title and interest, for all countries, jurisdictions and political entities of the world, along with the right to sue for past infringement, to all TRANSFERRED PATENTS listed on Appendices A and B, and corresponding counterpart foreign patents and patent applications, with respect to which, and to the extent to which, ASSIGNOR now has or hereafter acquires the right to so assign, convey, transfer and deliver. Agere Systems Guardian recognizes that ASSIGNOR holds only bare legal title to the TRANSFERRED PATENTS listed in Appendix A (which lists the United States Patents and patent applications previously exclusively licensed to Lucent Technologies Microelectronics Guardian Corp.).

ASSIGNOR and ASSIGNEE recognize that the patents listed in Appendices A and B may inadvertently include patents that are owned by various subsidiaries of ASSIGNOR, including Agere, Inc., Oritel Corporation, Optimay Corporation, Herrmann Technology, Inc., and Enable Semiconductor, Inc. Ownership of such patents shall not be affected by this Patent

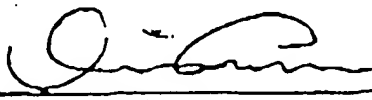
Assignment, and ASSIGNEE agrees that any such patents shall be deemed deleted from Appendices A and B.

ASSIGNOR agrees that, upon request it will, at any time without charge to Agere Systems Guardian, but at Agere Systems Guardian's expense, furnish all necessary documentation relating to or supporting chain of title, sign all papers, take all rightful oaths, and do all acts which may be necessary, desirable or convenient for vesting title to TRANSFERRED PATENTS in Agere Systems Guardian, its successors, assigns and legal representatives or nominees; including but not limited to any acts which may be necessary, desirable or convenient for claiming said rights and for securing and maintaining patents for said inventions in any and all countries and for vesting title thereto in Agere Systems Guardian and its respective successors, assigns and legal representatives or nominees.

Execution Copy

IN WITNESS WHEREOF, the parties have caused this PATENT ASSIGNMENT to be executed by their duly authorized representatives as of the Effective Date.

LUCENT TECHNOLOGIES INC.

By: 
Daniel P. McCurdy
President, Intellectual Property Business

AGERE SYSTEMS GUARDIAN CORP.

By: 
Fred M. Romano
President

Execution Copy

ACKNOWLEDGMENTS

STATE OF NEW JERSEY)

: ss:

COUNTY OF SOMERSET)

I CERTIFY that on January 30, 2001, Daniel P. McCurdy personally came before me and this person acknowledged under oath, to my satisfaction that:

a.) this person signed, sealed and delivered the attached Patent Assignment as President - Intellectual Property Business of Lucent Technologies Inc.; and

b.) this Patent Assignment was signed and made by Lucent Technologies Inc. as its voluntary act and deed by virtue of authority from its Board of Directors.



Name

TAMORA ANNE HANNA

Notary Public

Notary Public of New Jersey

My Commission Expires

Registered in Hunterdon County

[Notarial Seal]

My Commission Expires March 25, 2002

STATE OF FLORIDA)

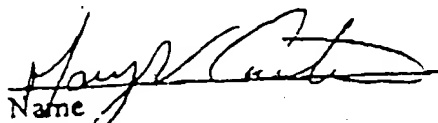
: ss:

COUNTY OF ORANGE)

I CERTIFY that on January 31, 2001, Fred M. Romano personally came before me and this person acknowledged under oath, to my satisfaction that:

a.) this person signed, sealed and delivered the attached Patent Assignment as Vice President of Agere Systems Guardian Corp.; and

b.) this Patent Assignment was signed and made by Agere Systems Guardian Corp. as its voluntary act and deed by virtue of authority from its Board of Directors.

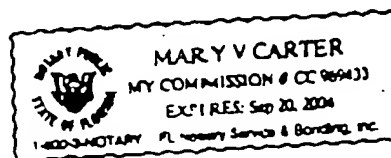


Name

Notary Public

My Commission Expires:

[Notarial Seal]



APPENDIX B (continued)
Transferred Patents

Case Name	Filing Date	Issue Date	Patent No.	Serial No.
				09/322122
Jelinek 4-3-3	5/27/1999			09/178720
Jin 1	10/26/1998		09/072248	
Jin 153-5	5/4/1998			09/231566
Jin 169-18	1/14/1999			09/196486
Jin 170-19-17-41	11/19/1998			09/187885
Jin 171-45	11/6/1998	10/12/1999	5965197	09/236966
Jin 174-47-43	1/25/1999			09/236933
Jin 178-49-45	1/25/1999			09/338520
Jin 181-2-6-47	6/23/1999			09/405641
Jin 185	9/24/1999			09/483297
Jin 188	1/14/2000			09/466449
Jin 192-23-3	12/17/1999			60/161291
Jin 193-4-39	10/25/1999			09/548574
Jin 196-9-25	4/13/2000			09/521513
Jin 197-55-56	3/8/2000		09/642216	
Jin 198-10-26-5	8/18/2000			09/488662
Jin 2	1/20/2000			09/488355
Jin 4	1/20/2000		08/835624	
Joh 6	4/9/1997			09/218179
Johanson 43	12/22/1998			09/305207
Johanson 59	5/5/1999			09/434299
Johanson 79-37	11/5/1999			09/342783
Johnson 1-29	6/29/1999		09/146591	
Johnson 3	9/3/1998			09/267279
Johnson 4	3/12/1999			09/174503
Johnson 54-44-5-1-17	10/16/1998		08/199910	
Johnston 37-13	2/22/1994			09/585159
Jones 1-20-24-1	6/1/2000		09/636454	
Kalish 1	8/11/2000		6067291	
Kamerman 8-8-4	9/23/1997	5/23/2000		09/428085
Kane 10-8-42	10/27/1999		08/957122	
Kane 1-1	10/24/1997			09/428184
Kane 12-9-45	10/27/1999			09/346853
Kane 6-4	7/2/1999			09/347498
Kane 7-6	7/2/1999			
Kannell 1-55-2	7/15/1998		09/115656	
Kapur 1-3-1	8/1/1997	5/16/2000	6064808	
Kapur 2-5-3	7/16/1998	4/18/2000	6051027	
Kapur 3-7	11/6/1998			09/187505
Kapur 5-10	10/26/1999			09/427238
Karanicolas 2	2/4/1997	7/25/2000	08/795195	6094093
Karri 1-5-3	10/31/1997	4/18/2000	6052808	
Karri 2-2	4/13/1999			09/291448
Karthikeyan 1-7-10-6-13	4/7/1999			09/287137
Karthikeyan 2-30-54	1/11/2000			09/480387
Karunatilaka 1-3	7/18/2000			09/618172
Katsap 1-5	6/22/1999			09/337741
Katsap 3-10-7	5/6/1999			09/306287
Katsap 4-11-8	5/7/1999			09/310701
Katsap 5-1-1-10-1	6/9/2000			09/591625
Katsap 6-2-2-11-2	6/9/2000			09/591627
Katsap 7-1-1-12	10/7/1999			09/414004
Katz 31-2-3	3/29/1999			09/280103
Katz 35-3-4	1/3/2000			09/476511
Katz 36	5/17/2000			09/572207
Katz 38	6/28/2000			09/605507
Katz 38	10/29/1998			09/181568
Kaufman 13	11/18/1997		08/972884	
Kaufman 5	2/24/1996		09/028479	
Kaufman 6	9/11/1998		09/151670	
Kaufman 9-7				

Delaware

PAGE 1

The First State

I, HARRIET SMITH WINDSOR, SECRETARY OF STATE OF THE STATE OF DELAWARE, DO HEREBY CERTIFY THE ATTACHED IS A TRUE AND CORRECT COPY OF THE CERTIFICATE OF OWNERSHIP, WHICH MERGES:

"AGERE SYSTEMS GUARDIAN CORP.", A DELAWARE CORPORATION, WITH AND INTO "AGERE SYSTEMS INC." UNDER THE NAME OF "AGERE SYSTEMS INC.", A CORPORATION ORGANIZED AND EXISTING UNDER THE LAWS OF THE STATE OF DELAWARE, AS RECEIVED AND FILED IN THIS OFFICE THE TWENTY-NINTH DAY OF AUGUST, A.D. 2002, AT 9 O'CLOCK A.M.

AND I DO HEREBY FURTHER CERTIFY THAT THE EFFECTIVE DATE OF THE AFORESAID CERTIFICATE OF OWNERSHIP IS THE THIRTY-FIRST DAY OF AUGUST, A.D. 2002.

A FILED COPY OF THIS CERTIFICATE HAS BEEN FORWARDED TO THE NEW CASTLE COUNTY RECORDER OF DEEDS.



Harriet Smith Windsor
Harriet Smith Windsor, Secretary of State

3268412 8100M

020545223

AUTHENTICATION: 1959517

DATE: 08-29-02

STATE OF DELAWARE
SECRETARY OF STATE
DIVISION OF CORPORATIONS
09:00 AM 08/29/2002
20545223 - 3268412

CERTIFICATE OF OWNERSHIP AND MERGER

OF

Agere Systems Guardian Corp.
(a Delaware corporation)

INTO

Agere Systems Inc.
(a Delaware corporation)

UNDER SECTION 253 OF THE GENERAL CORPORATION LAW OF THE STATE OF DELAWARE

Agere Systems Inc., a corporation organized and existing under the laws of Delaware ("Corporation"), DOES HEREBY CERTIFY:

FIRST: The Corporation is the owner of all of the outstanding shares of common stock of Agere Systems Guardian Corp., which is also a business corporation of the State of Delaware.

SECOND: On August 22, 2002 the Subsidiary Governance Committee of the Board of Directors of the Corporation adopted the following resolution to merge Agere Systems Guardian Corp. into the Corporation:

RESOLVED that Agere Systems Guardian Corp., a Delaware corporation, shall be merged with and into Agere Systems Inc., a Delaware corporation, with Agere Systems Inc. being the surviving corporation, and Agere Systems Inc. shall thereupon assume all of the obligations of Agere Systems Guardian Corp."

THIRD: That the merger authorized hereby shall become effective as of 9:00 a.m. Eastern Standard Time on August 31, 2002.

Executed on August 22, 2002

AGERE SYSTEMS INC.

By Paul Bento
Paul Bento, Vice President